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PATENT & TRADEMARK OFFICE

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF	:	
KAZUHITO KUROSE et al.	:	GROUP ART UNIT: 1742
SERIAL NO.: 10/550,067	:	
FILED: SEPTEMBER 21, 2005	:	EXAMINER: SIKYIN, IP
FOR: COPPER-BASED ALLOY	:	

DECLARATION UNDER 37 CFR 1.132

HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS
WASHINGTON, D.C. 20231

SIR:

Now comes Tomoyuki OZASA who declares and states that:

1. I am one of the inventors of the invention claimed in the above-identified application.

2. I graduated from Shinshu University, Faculty of Engineering, in March 1998. I entered KITZ CORPORATION in April 1998, and am now a Senior Staff Member, Material Research Group, Division of Research, Engineering Headquarters Office of said CORPORATION.

3. I have studied the Official Action of January 17, 2007 and the reference cited therein, namely U.S. Patent No. 5,942,056.

4. I conducted the Experiment to confirm that the presence of misch metal in Mm+Te inhibited the effect of improving the high-temperature characteristic Te had.

Nos. 1 to 6 were alloy samples tested for their respective tensile strengths at a temperature of 150°C. No. 1 was a standard alloy sample having its components added with Te alone. Nos. 2 to 4 were alloy samples having the components of No. 1 added with Mm for confirming that their characteristics were deteriorated. No. 5 was an alloy sample having the components of No. 3 added with Se for confirming that Mm acted on the alloy sample in the presence of Se+Mm. Since during the course of casting of No. 3 large amounts of Mm oxides were produced, it was judged that further addition of Mm made it

impossible to obtain any good-quality product due to an increase of defects. In alloy sample No. 4, teeming was conducted after Mm introduced into a furnace made sufficient reaction with the components. No. 6 was an alloy sample that had the same composition as No. 3, but was coated with carbon to suppress the oxidation of Mm and reduce the casting defects, for accurately judging the affection of Mm. The test results were shown in the table below.

No.	Target Component Values (mass %)									Tensile Strength at 150°C (MPa)
	Sn	Zn	Bi	Te	Mm	Se	Pb	P	Cu	
1	4	8	1.3	0.2	0		0.02	0.02	Balance	158
2	4	8	1.3	0.2	0.1		0.02	0.02	Balance	111
3	4	8	1.3	0.2	0.2		0.02	0.02	Balance	81
4	4	8	1.3	0.2	0.5		0.02	0.02	Balance	95
5	4	8	1.3	0.2	0.2	0.2	0.02	0.02	Balance	105
6	4	8	1.3	0.2	0.2		0.02	0.02	Balance	96

It was confirmed from the table above that the addition of Mm deteriorated the tensile strength at 150°C.

It was confirmed from the same that the addition of Se slightly enhanced the characteristic. It was conceivable that Mm was bonded to Se to form slag that was removed to reduce the amount of Mm inhibiting Te.

Though No. 4 was a benchmark having a larger amount of Mm than No. 3 added thereto, No. 4 was slightly higher in characteristic than No. 3. It was conceivable that the result originated from the content of Mm in No. 4 after the test having been reduced in consequence of the sufficient reaction of Mm in the dissolving furnace.

Though the coating with carbon enabled the amount of the Mm oxides to be reduced, oxidation occurred during the teeming and, as a result, it was found that the oxides were entangled in the sample.

5. It was concluded that Mm deteriorated the effect of Te that improved the high-temperature characteristic. It was conceivable that Mm was bonded to Te and existed in the alloy sample as an intermetallic compound to inhibit bonding between Te and Pb.

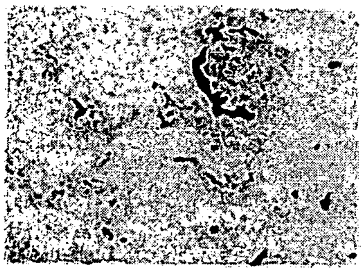
6. Further declarant saith not.

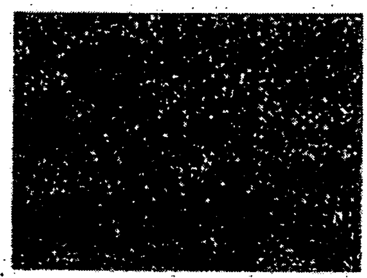
May 15, 2007
Date

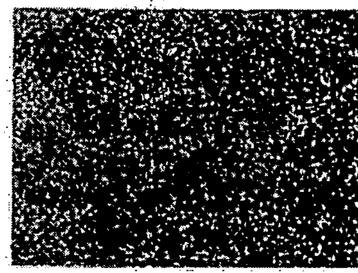
Tomoyuki Ozasa
Signature

Tomoyuki OZASA
Name

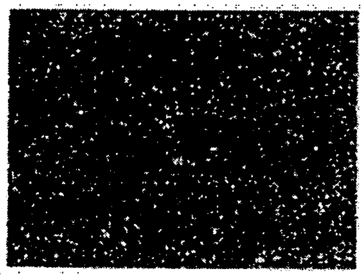
EDX analysis result photographs

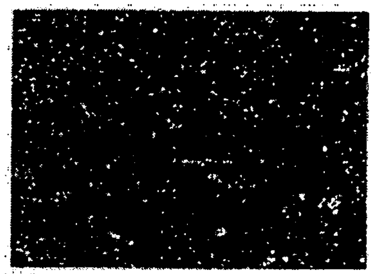

①Copper Ka1

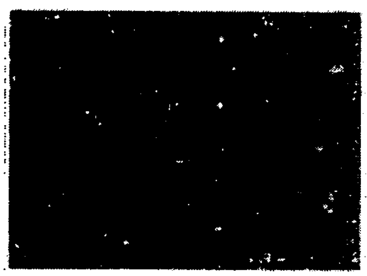

②Tin La1

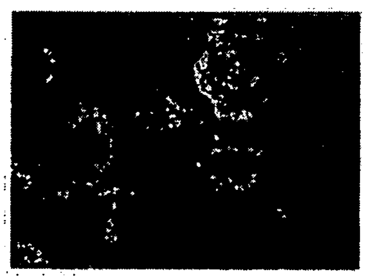

③Zinc Ka1

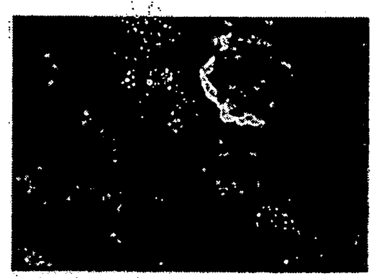

④Bismuth La1

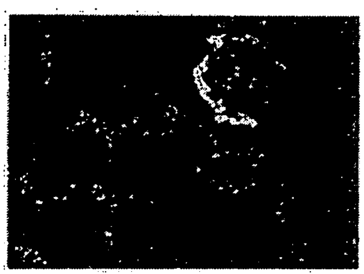

⑤Selenium Ka1

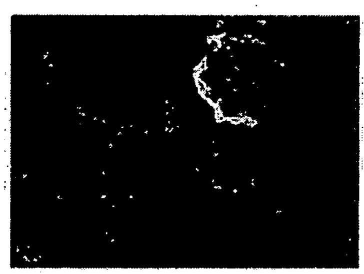

⑥Lead La1


⑦Phosphorus Ka1


⑧Tellurium La1


⑨Cerium La1


⑩Lanthanum La1


⑪Neodymium La1